ABSTRACT

Delivering heat from modern high temperature solar collectors to a storage tank is more effectively done using a pressurized, high temperature fluid loop using non-flammable and low toxicity heat transfer fluids and is the subject of this patent. Toxic and Non-toxic water/antifreeze mixtures can be used in pressurized loops, i.e. approximately 14 pounds per square inch above atmosphere, raising the boiling point to 265 degrees Fahrenheit. To achieve a pressurized loop, which automatically eliminates trapped air in a practical manner, a pressurized radiator, a pressurizing/vacuum recover cap and overflow reservoir are used. The system protects itself from loss of fluid flow by boiling under pressure. The steam produced is either condensed in a liquid to air radiator and returned to the closed loop system to keep it full, or the steam pressure will be used to open vents on the solar collector allowing air to pass over and cool the solar collector. Fluid and electrical connections between the solar collector and storage tank are made using a weather-proof insulated umbilical. Heat in the pumped fluid loop is delivered to the existing hot water storage tank by means of an adaptable, internal, double walled, heat exchanger.